To: Ex. 6 - Personal Privacy
From: Meyer, Susan
Sent: Mon 2/13/2017 5:08:53 PM
Subject: FW: HTL slide notes

From: Meyer, Susan (ECY) [mailto:sume461@ECY.WA.GOV]
Sent: Friday, February 10, 2017 2:58 PM
To: Meyer, Susan <meyer.susan@epa.gov>
Subject: HTL slide notes

-Who cares? The Fish Commission and Tribes, Earth Justice, who filed a petition to EPA about 2 years ago to encourage them to take CWA jurisdiction, and NMFS (ESA-listed species) and EPA care.

-We are each standing at one of the elevation options that Heather discussed.

-You can see that the distance between them depends on the slope of the beach. Tulalip is relatively gently sloped, so there is approximately 23 feet between mhhw AND Hat.

-Within that 23 feet, there is critical habitat for other species who care, such as juvenile salmon (migration route in shallow water), surf smelt and sand lance (egg laying), shellfish larvae, and insects that hang out with the drift logs and seagrass/macroalgae detritus (provide food for juv salmon and forage fish). In addition, the backshore vegetation can provide additional insects to the beach as well as shade to prevent forage fish egg dessication plus a water filtering component from stormwater runoff.

When there are bulkheads or other development built in that critical habitat, there are consequences. 1. There is a direct loss of forage fish spawning habitat and Juvenile salmon migration area. Click

-You can see that there is spawning in this upper intertidal, and when a development occurs at MHHW, as shown in the bulkhead photo, click, these fish are forced to spawn in deeper water up against the bulkhead. WDFW has conducted numerous studies on FF egg presence, and one of their findings was that when there was a bulkhead at or near MHHW, the eggs were found

clumped up against the bulkhead. They also found that in areas without bulkheads or armoring, about 40% of the eggs located and identified were above MHHW.

-As important, is the fact that juvenile salmon species, including chinook, migrate along the shallow waters of the intertidal zone. When there is development at MHHW, CLICK they are forced into deeper water when the tide is up and are much more prone to predation by larger fish that lurk in the depths.

-Plus, the finer grained sands and gravels that are good substrate for FF, shellfish and PEOPLE, are often washed away due to the mechanical forces of wave action on armoring, which is also responsible for fewer drift logs, which harbor insects for food. Megan Dethier and her collegues from UW conducted a study on numerous beaches around PS in 2015/16 and found that the lower the shoreline armoring is on the beach, the more detrimental effects to the intertidal environment there is.